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File: USPT

Sep 3, 2002

US-PAT-NO: 6446005

DOCUMENT-IDENTIFIER: US 6446005 B1

TITLE: Magnetic wheel sensor for vehicle navigation system

DATE-ISSUED: September 3, 2002

## INVENTOR-INFORMATION:

| NAME               | CITY    | STATE | ZIP CODE | COUNTRY |
|--------------------|---------|-------|----------|---------|
| Bingeman; Kirk     | Phoenix | AZ    |          |         |
| Velasquez; Richard | Phoenix | AZ    |          |         |
| Tekniepe; William  | Mesa    | AZ    |          |         |

## ASSIGNEE-INFORMATION:

| NAME          | CITY     | STATE | ZIP CODE | COUNTRY | TYPE CODE |
|---------------|----------|-------|----------|---------|-----------|
| Prolink, Inc. | Chandler | AZ    |          |         | 02        |

APPL-NO: 09/ 373556 [PALM]

DATE FILED: August 13, 1999

INT-CL: [07] B62 D 1/28

US-CL-ISSUED: 701/215; 701/216, 701/217, 701/213, 342/357, 342/106, 342/107, 342/137, 342/457, 180/167, 180/168

US-CL-CURRENT: 701/215; 180/167, 180/168, 342/106, 342/107, 342/137, 342/457, 701/213, 701/216, 701/217

FIELD-OF-SEARCH: 701/215, 701/216, 701/217, 701/213, 701/214, 180/168, 180/167, 377/24.1, 342/357, 342/357.14, 342/107, 342/106, 342/108, 342/457, 342/451, 342/463, 473/407, 473/409, 473/137, 473/169

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| <input type="checkbox"/> | <u>4109186</u> | August 1978   | Farque        | 318/587  |
| <input type="checkbox"/> | <u>4480310</u> | October 1984  | Alvarez       | 364/450  |
| <input type="checkbox"/> | <u>4887281</u> | December 1989 | Swanson       | 377/24.1 |
| <input type="checkbox"/> | <u>5600113</u> | February 1997 | Ewers         | 235/95R  |

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| <input type="checkbox"/> | <u>5938704</u> | August 1999   | Torii         | 701/23  |
| <input type="checkbox"/> | <u>5944132</u> | August 1999   | Davies et al. | 180/168 |
| <input type="checkbox"/> | <u>6024655</u> | February 2000 | Coffee        | 473/407 |

ART-UNIT: 3661

PRIMARY-EXAMINER: Cuchlinski, Jr.; William A.

ASSISTANT-EXAMINER: To; Tuan C

ATTY-AGENT-FIRM: Blank Rome Comisky & McCauley LLP

ABSTRACT:

A system is disclosed for determining precise locations of the golf carts on a golf course in real time as the carts are in use during play of the course. Each cart is outfitted with a dead reckoning navigation (DRN) system for determining speed and direction, and a compass for determining heading of the cart during play. With these parameters and a known origin of the cart to which the DRN system has been calibrated, such as location of a tee box, the location of the cart relative to a known feature of the course such as a cup or hazard may be calculated. The DRN system uses a magnetic wheel sensor assembly having a magnetic strip with spaced alternating opposite magnetic poles affixed to the rim of an inside wheel well or mounting fixture therefor of the cart, mounted to confront a Hall effect sensor. During rotation of the wheel and the strip when the cart is moving, the sensor detects passage of the alternating poles, to measure speed and forward or backward direction of the cart. A compass determines heading of the cart. The DRN system allows operation on courses where GPS-based systems cannot maintain LOS, and is periodically calibrated by a known signal, such as a DGPS signal.

16 Claims, 13 Drawing figures

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L3: Entry 1 of 1

File: USPT

Apr 17, 2001

US-PAT-NO: 6219609

DOCUMENT-IDENTIFIER: US 6219609 B1

TITLE: Vehicle dynamic control system

DATE-ISSUED: April 17, 2001

## INVENTOR-INFORMATION:

| NAME               | CITY  | STATE | ZIP CODE | COUNTRY |
|--------------------|-------|-------|----------|---------|
| Matsuno; Koji      | Tokyo |       |          | JP      |
| Matsuura; Munenori | Tokyo |       |          | JP      |
| Konno; Toshihiro   | Tokyo |       |          | JP      |
| Takahashi; Akira   | Tokyo |       |          | JP      |
| Mine; Atsushi      | Tokyo |       |          | JP      |

## ASSIGNEE-INFORMATION:

| NAME                          | CITY  | STATE | ZIP CODE | COUNTRY | TYPE CODE |
|-------------------------------|-------|-------|----------|---------|-----------|
| Fuji Jukogyo Kabushiki Kaisha | Tokyo |       |          | JP      | 03        |

APPL-NO: 09/ 174538 [PALM]

DATE FILED: October 19, 1998

## FOREIGN-APPL-PRIORITY-DATA:

| COUNTRY | APPL-NO  | APPL-DATE        |
|---------|----------|------------------|
| JP      | 9-288785 | October 21, 1997 |

INT-CL: [07] B60 T 8/00

US-CL-ISSUED: 701/72; 701/41, 701/83, 701/88, 303/140

US-CL-CURRENT: 701/72; 303/140, 701/41, 701/83, 701/88

FIELD-OF-SEARCH: 701/36, 701/72, 701/78, 701/83, 701/88, 701/69, 701/208, 701/213, 303/140, 303/146, 348/118, 348/119

PRIOR-ART-DISCLOSED:

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US-CL

5183131

February 1993

Naito

180/233

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|--------------------------|----------------|---------------|------------------|---------|
| <input type="checkbox"/> | <u>5265020</u> | November 1993 | Nakayama         | 701/36  |
| <input type="checkbox"/> | <u>5301768</u> | April 1994    | Ishikawa         |         |
| <input type="checkbox"/> | <u>5315295</u> | May 1994      | Fujii            |         |
| <input type="checkbox"/> | <u>5661650</u> | August 1997   | Sekine et al.    | 701/82  |
| <input type="checkbox"/> | <u>5685386</u> | November 1997 | Kondo et al.     | 180/76  |
| <input type="checkbox"/> | <u>5742240</u> | April 1998    | Asanuma et al.   | 340/995 |
| <input type="checkbox"/> | <u>5757949</u> | May 1998      | Kinoshita et al. | 382/104 |
| <input type="checkbox"/> | <u>6067497</u> | May 2000      | Sekine et al.    | 701/93  |
| <input type="checkbox"/> | <u>6076034</u> | June 2000     | Satoh et al.     | 701/70  |

## FOREIGN PATENT DOCUMENTS

| FOREIGN-PAT-NO | PUBN-DATE   | COUNTRY | US-CL |
|----------------|-------------|---------|-------|
| 789 225 A1     | August 1997 | EP      |       |
| 2-70561        | March 1990  | JP      |       |

ART-UNIT: 361

PRIMARY-EXAMINER: Zanelli, Michael J.

ATTY-AGENT-FIRM: Smith, Gambrell &amp; Russell

## ABSTRACT:

The present invention provides a vehicle dynamic control system which alters characteristics of respective vehicle movement controllers so that they can function properly against coming and foreseeable running conditions and current running conditions, recognizing beforehand details of an emerging curve on the road to be traveled. The system comprises a vehicle movement control alterant and at least one among vehicle movement controllers, i.e., a brake controller, a left/right wheel differential limiter controller and power distribution controller. When the vehicle is approaching the curve, the vehicle movement control alterant alters characteristics of a braking controller, the left/right wheel differential limiter controller and the power distribution controller to those favorable to turning for driving through a curve appropriately. When the vehicle is approaching the curve end, the alterant alters characteristics of the left/right differential controller to those favorable to stabilizing running so that the vehicle can pass the curve end and go into straight road appropriately.

15 Claims, 14 Drawing figures

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L1: Entry 1 of 3

File: USPT

Sep 3, 2002

US-PAT-NO: 6446005

DOCUMENT-IDENTIFIER: US 6446005 B1

TITLE: Magnetic wheel sensor for vehicle navigation system

DATE-ISSUED: September 3, 2002

## INVENTOR-INFORMATION:

| NAME               | CITY    | STATE | ZIP CODE | COUNTRY |
|--------------------|---------|-------|----------|---------|
| Bingeman; Kirk     | Phoenix | AZ    |          |         |
| Velasquez; Richard | Phoenix | AZ    |          |         |
| Tekniepe; William  | Mesa    | AZ    |          |         |

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| NAME          | CITY     | STATE | ZIP CODE | COUNTRY | TYPE CODE |
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| Prolink, Inc. | Chandler | AZ    |          |         | 02        |

APPL-NO: 09/ 373556 [PALM]

DATE FILED: August 13, 1999

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US-CL-ISSUED: 701/215; 701/216, 701/217, 701/213, 342/357, 342/106, 342/107, 342/137, 342/457, 180/167, 180/168

US-CL-CURRENT: 701/215; 180/167, 180/168, 342/106, 342/107, 342/137, 342/457, 701/213, 701/216, 701/217

FIELD-OF-SEARCH: 701/215, 701/216, 701/217, 701/213, 701/214, 180/168, 180/167, 377/24.1, 342/357, 342/357.14, 342/107, 342/106, 342/108, 342/457, 342/451, 342/463, 473/407, 473/409, 473/137, 473/169

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|                          | PAT-NO         | ISSUE-DATE    | PATENTEE-NAME | US-CL    |
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| <input type="checkbox"/> | <u>4109186</u> | August 1978   | Farque        | 318/587  |
| <input type="checkbox"/> | <u>4480310</u> | October 1984  | Alvarez       | 364/450  |
| <input type="checkbox"/> | <u>4887281</u> | December 1989 | Swanson       | 377/24.1 |
| <input type="checkbox"/> | <u>5600113</u> | February 1997 | Ewers         | 235/95R  |

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|--------------------------|----------------|---------------|---------------|---------|
| <input type="checkbox"/> | <u>5878369</u> | March 1999    | Rudow et al.  | 701/215 |
| <input type="checkbox"/> | <u>5938704</u> | August 1999   | Torii         | 701/23  |
| <input type="checkbox"/> | <u>5944132</u> | August 1999   | Davies et al. | 180/168 |
| <input type="checkbox"/> | <u>6024655</u> | February 2000 | Coffee        | 473/407 |

ART-UNIT: 3661

PRIMARY-EXAMINER: Cuchlinski, Jr.; William A.

ASSISTANT-EXAMINER: To; Tuan C

ATTY-AGENT-FIRM: Blank Rome Comisky & McCauley LLP

ABSTRACT:

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16 Claims, 13 Drawing figures

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L4: Entry 1 of 1

File: USPT

Apr 17, 2001

DOCUMENT-IDENTIFIER: US 6219609 B1


TITLE: Vehicle dynamic control system

Detailed Description Text (94):


The vehicle position detection sensor 110a gathers running information related to the vehicle's position. The sensor 110a consists mainly of a GPS (Global Positioning System) receiver to receive positioning signals from GPS satellites so as to determine the position of the vehicle; a magnetic sensor to detect the absolute running direction of the vehicle; and a wheel speed sensor composed of an electromagnetic pickup facing an outer periphery of a rotor fixed to the wheel to output a pulse signal when it crosses projections on the outer periphery of the rotor.

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(*tăf'kă-mă'ēter*) , instrument that indicates the speed, usually in revolutions per minute, at which an engine shaft is rotating. Some tachometers, especially those used in automobiles, are similar in construction and operation to automotive [speedometers](#) . Other types, often connected directly to the shaft whose speed they indicate, are small electric generators whose output voltage is proportional to speed. This voltage is applied to a voltmeter whose dial is calibrated in speed units. Another type, used only with engines having an ignition system, operates by counting the pulsations of current or voltage in the ignition system, the number of these being proportional to the speed of the shaft.

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 Date: 02/16/1989; Reading Level: 9.  
 Publication: EDN; Author: McClelland, William ; Source: MAGAZINES



**Digital Tachometer Counter.(Model 461501)(Brief Article)(Product Announcement)**  
 Date: 06/01/2000; Reading Level: 9.  
 Publication: Poptronics; Author: ; Source: MAGAZINES



**Motor controller eliminates tachometer.**  
 Date: 08/18/1988; Reading Level: 9.  
 Publication: EDN; Author: Friedman, Barry ; Source: MAGAZINES



**Hand-Held tachometers. (Test Equipment 2002).(from Ono Sokki Technology Inc.)(Brief Article)(Product Announcement)**  
 Date: 02/01/2002; Reading Level: 9.  
 Publication: Diesel Progress North American Edition;  
 Author: ; Source: MAGAZINES



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 Publication: Plant Engineering; Author: ; Source: MAGAZINES

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